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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/542,493

**Applicant(s)**

STRAND ET AL.

**Examiner**

GURPREET KAUR

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3 and 20-42 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 36-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-35 and 39-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 9/01/2005
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of the Claims***

1. Claims 3 and 20-42 are pending in the application.

Claims 3, and 36-38 are withdrawn and 1, 2, 4-19 and 42-97 are cancelled.

***Election/Restrictions***

2. Applicant's election with traverse of claims 20-35 and 39-42, drawn to a method of determining isoelectric point, in the reply filed on August 10, 2009 is acknowledged. The traversal is on the ground(s) that claims 3 and 36-38 of group I and III are so closely related to elected claims 20-35 and 39-42 that they should remain in the same application. This is not found persuasive because regardless of search method, invention of different limitations will require different search strategies, and the times to consider the relevancy of collective references would increase proportionally as well. Claim 3 teaches a device comprised of titration chamber and a band detector and claim 36 uses a method to develop two-dimensional display of information regarding charged analyte to determine the molecular weight of the charged analyte. Group II, claims 20-35 and 39-42 do not require either the titration chamber or a band detector and group II method further does not determine the molecular weight of the charged analyte. The requirement is still deemed proper and is therefore made FINAL. Therefore, claims 3 and 36-38 are withdrawn from consideration.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claim 20, 22, 29-32,35, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343) in view of Luner et al. (U.S. Pat. No. 3,664,939) and Witt et al. (U.S. Pat. No. 7,118,660).

Regarding claim 20, Hjerten et al. teaches the method of isoelectric focusing and mobilizing a focused pattern of protein zones (see col. 1, lines 1-10).

protein (charge analyte) in a anolyte or the catholyte (flowing liquid) under electric field gradient to form a focused discrete zones (see col. 2, lines 33-45 and 55-64);

changing the pH of the either the anolyte or the catholyte or both to move the entire pattern of protein zones as a unit under applied voltage (see col. 1, lines 50-59);

corresponding position data of all the protein bands across a single detection point in the medium for on-line detection (see col. 3, lines 36-38).

Hjerten et al. does not specifically indicate determining the isoelectric point based on the pH of the flowing liquid and position data.

However, it is well known in the art of isoelectric focusing that isoelectric point of the protein or charged particle is the pH of the liquid where the net electrical charge of the protein is zero and that is isoelectric point of the protein.

Moreover, Luner et al. teaches the method of determining the pH value of the liquid to determine the isoelectric point of the proteins (see abstract and col. 2, lines 17-21 and col. 1, lines 29-40).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the step of Luner et al. with the method of Hjerten et al. because the step determines the isoelectric point of the proteins.

Furthermore, Witt et al. teaches isoelectric focusing method wherein the measuring the speed in time of the separated bands at the point of detection allows to derive the information about the isoelectric point (see col. 5, lines 33-41).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the step of Witt et al. with the method of Hjerten et al. to determine the position data of the separated bands.

4. Regarding claim 22, Hjerten et al. teaches varying the pH of either the anolyte or catholyte or both such that both have pH's above or below the isoelectric point of the substance to be mobilized (see col. 2, lines 65-68 over to col. 3, lines 1-2).

5. Regarding claims 29, 30 and 32, Hjerten et al. teaches charged analyte is a protein (biomacromolecule) (see col. 1, lines 48-50) and proteins are inherently multiple charged analytes.
6. Regarding claim 31, Witt et al. teaches DNA analysis can also be formed (see col. 4, lines 1-3).
7. Regarding claim 35, Hjerten et al. teaches changing the pH of both the anolyte (0.02 M phosphoric acid) and catholyte (0.02M hydroxide) of known concentration with known concentration of titration liquid (0.02M sodium hydroxide and 0.02 M phosphoric acid) respectively (see example 1).
8. Regarding claims 39 and 40, Hjerten et al. teaches proteins are focused under electric field gradient (EFGF) in a separation medium and then mobilized the focused bands of proteins (see col. 2, lines 55-68 over to col. 3, lines 1-2). It is obvious to person of ordinary skill in the art EFGF occurs in a chamber.
9. Claims 21, 24, 26, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Yang et al. (U.S. Pat. No. 4,666,855).

Regarding claim 21, Hjerten et al. in view of Luner et al. and Witt et al. does not teach isoelectric point is determined by extrapolation.

However, Yang et al. teaches the method of determining isoelectric point of an amphoteric molecule comprising (see col. 3, lines 13-16) the step of extrapolating the profile to determine the isoelectric point which are in excellent agreement with the literature value (see col. 10, lines 10-15).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the extrapolating step of Yang et al. with the method of Hjerten et al. in view of Luner et al. and Witt et al. because extrapolating step provided excellent isoelectric point value when compared with literature value.

10. Regarding claims 24 and 26, Hjerten et al. does teach changing the pH's of the both the anolyte and catholyte which vary in the same direction from the isoelectric points of each protein by replacing the catholyte for anolyte and vice versa. (see col. 2, lines 65-68 over to col. 3, lines 1-5).

Hjerten et al. in view of Luner et al. and Witt et al. does not teach pH of the flowing liquid is changed in increments and isoelectric point is calculated by averaging the upper bracket pH and lower bracket pH.

However Yang et al. teach the method of determining the isoelectric point of an amphoteric molecule (see col. 3, lines 13-16) comprising the step of changing (incrementing) the pH above of the isoelectric point to the below of the isoelectric point to obtain higher and lower plateau (see figure 1) and isoelectric point is determined by

averaging the higher and lower bracketing absorbance at the corresponding pH (see Table 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the method of determining the isoelectric point of Yang et al. with the Hjerten et al. in view of Luner et al. and Witt et al. because Yang et al. method allows to calculate the isoelectric point in any type of buffer system (see col. 4, lines 17-19).

11. Regarding claim 33, Hjerten et al. teaches a light absorption technique is used to detect the recover the individual protein bands (see col. 3, lines 36-43).

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Malabarba et al. (U.S. Pat. No. 5,521,155).

Regarding claim 23, Hjerten et al. in view of Luner et al. and Witt et al. does not teach that isoelectric point is determined by interpolation.

However, Malabarba et al. teaches that isoelectric point of each antibiotic was determined by interpolation on a curve (see col. 51, lines 35-45).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to include the interpolation step of Malabarba et al. with the Hjerten et al. in view of Luner et al. and Witt et al. because interpolation method is known to be used to determine isoelectric point.



13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Zhu et al. (U.S. Pat. No. 5,110,434).

Regarding claim 25, Hjerten et al. does teach changing the pH's of the both the anolyte and catholyte which vary in the same direction from the isoelectric points of each protein by replacing the catholyte for anolyte and vice versa. (see col. 2, lines 65-68 over to col. 3, lines 1-5).

Hjerten et al. in view of Luner et al. and Witt et al. are silent to titrating the anolyte or catholyte with dialyzing ions.

However, Zhu et al. teaches titrating the anolyte and catholyte with zwitterions (dialyzing ions) to a fixed pH (see col. 5, lines 20-34 and 39-44).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the zwitterions mobilization method of Zhu et al. with Hjerten et al. in view of Luner et al. and Witt et al. method because zwitterions mobilization method provides continuous expanding zone in the medium which prevents broadening of late-migrating and slow-moving peaks (see col. 2, lines 50-53 and 28-30).

14. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Ivory et al. (U.S. Pat. No. 6,277,258).

Regarding claim 27, Hjerten et al. in view of Luner et al. and Witt et al. does not teach charged analyte is first focused in a DFGF chamber.

However, Ivory et al. teaches method of focusing a charged solute (see abstract) wherein the charged solute is focused in DFGF chamber (10) (see col.13, lines 20-23), focusing in DFGF chamber provides proteins being focused away from their isoelectric point thus avoiding the precipitates that often form near the isoelectric point (see col. 13, lines 55-62).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the step of focusing the charged solute in DFGF chamber of Ivory et al. with the Hjerten et al. in view of Luner et al. and Witt et al. method because the step provides proteins being focused away from their isoelectric point thus avoiding the precipitates that often form near the isoelectric point.

15. Regarding claim 28, Ivory et al. teaches that DFGF chamber comprises a separation chamber (12) (see figure 1) which comprises chromatography media (see col. 9, lines 5-16) and under applied electric field gradient the protein bands focused, separated and eluted from the device (see col. 7, lines 1-7).

16. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Ness et al. (U.S. Pat. No. 6,613,508).

Regarding claim 34, Hjerten et al. in view of Luner et al. and Witt et al. does not specifically indicated the sample is split before being focused and incremented.

However, Ness et al. teaches the sample splitter which splits the sample into fractions for further analysis or storage (see col. 84, lines 18-23).

Moreover, it is obvious to person of ordinary skill in the art to spilt sample into smaller volume to perform analysis at faster rate.

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the sample splitter to spilt the sample of Ness et al. with the Hjerten et al. in view of Luner et al. and Witt et al. method because splitting the sample into fractions for analysis can be at faster rate.

17. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hjerten et al. (U.S. Pat. No. 4,725,343), Luner et al. (U.S. Pat. No. 3,664,939), Witt et al. (U.S. Pat. No. 7,118,660) and further in view of Ivory et al. (U.S. Pat. No. 6,277,258).

Regarding claims 41 and 42, Hjerten et al. in view of Luner et al. and Witt et al. does not specifically indicated that EFGF chamber comprises a configured electrode chamber and a separation chamber.

However, Ivory et al. teaches method of focusing a charged solute (see abstract) under electric field gradient (see col. 5, lines 35-39 and 59-61) wherein the charged solute is focused in device (10) comprised of configured electrode chamber (14) and separation chamber (12) (see figure 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate configured electrode chamber and separation chamber of Ivory et al. with the Hjerten et al. in view of Luner et al. and Witt et al. method because the configured chambers provides a compact and portable assembly.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GURPREET KAUR whose telephone number is (571)270-7895. The examiner can normally be reached on Monday-Friday (Alternate Friday Off), 8:00-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/

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Supervisory Patent Examiner, Art Unit 1753

/G. K./

Examiner, Art Unit 1795

11/5/09